# Agricultural Department.

J. P. STELLE, EDITOR.

I URLISHER'S NOTICE-All communications intended for this department should be addressed to PROF. J. P. STELLE, Fort Worth, Tex.

Barley Culture in Texas.

Mr. William L. Pierce, postmaster at Gainesville, Tex., kindly sends THE GA-ZETTE a letter to himself written by Mr. George W. Wadsworth, an extensive grain and malt material dealer in Boston, Mass. , with reference to samples of Texas grown barley lately received by him. In his accompanying note Mr. Pierce says: 'You w li see in the letter that special credit is given to Reeves county, though in fact the counties of Childress, Hardsman and Wilbarger had equally as fine samples at the Bos on exhibit. With such a product as sent to Boston you will not lorg have to work up a reputation for your new brewery. I doubt if any country can produce such fine barley as can lexas, judging from this showing and particularly those regions of our state tributary to Fort Worth. I hope, and feel sure, that our farmers will soon see it to their advantage to go largely into barley culture. You have permission to use the letter inclosed, in any way that in your judgment will do the most

In a postseript Mr. Pierce adds that the writer of the letter gave a sample of the Texas barley to a Mr. Burkhardt, the largest brewer in Boston, and that Mr. Burkburdt said it was as fine a sample as he had ever seen, either from Cannds or California, the two grains that have long carried the reputation of being the best known. Following is the letter: Boston, Sept. 9, 1890.

Frank Sin-I have to ted a sample of Reeves county. Team, ha key a differential as shown by proceed, it is prouding to price ion. It is a pame, had soom wrain, and I can see no rea on why m I m defrom such hardy should not be equal now yer spect to that made from Cambag am. Should a yof your sients be noted to make up so much as a car oal of such a large y! would, were they to ship it to me, have it mait denie to make up so much as a car oal of such it mat denie to make who should not be rolled to make up to ship it to me, have it mait denie the mait worked into beer. While not at all questioning his merits, this would, of on se, he a true test of its worth-one that would place it entirely beyond the nakes of or bit. I may add that the shipment of a single carload would not be likely to pay a profit to tile hippers, y til might pay right to ally in the eat. If the brewer he infinit a Teams builty would in wer their purpose as well as on de barley there is every reason for supposing that a large and profitable trade could be worked up for Texas. I have made a specialty of barley and midt for miny years and am ready to us my expression to the lest pos the advantage for your sends and your size should be favored with shipments from Texas. Respectively. cored with shipments from Texas. Respect It will be seen by a reference to the

map of Texas that the countles sending the specimens of barley so favorably received are widely separated. county is near the western border of Texas-the stranger will find it by tracing the Texas and Pacine railroad to Pecos river. The counties of Wilbarger, Hardeman and Childress may be found by following up the Fort Worth and Denver City railroad to about the beginning of the Panhandle proper. great distance apart of the localities is interesting as establishing the strong probability that all Northern Texas is well adapted to the growth of barley. We consider it more than merely probable that all regions of Texas capable of producing wheat successfully would also produce barley. This rule, as is well known, would take in a very large proportion of our state.

Every section of country capable of producing wheat is not also capable of successfully producing barley. It requires peculiar atmospheric conditions for the crop. Exactly what those conditions are we are unprepared to set forth at present, but quite likely a dry atmosanada's peculiarities, and we know that the same is a peculiarity of Californin; and since these two sections are now the leading barley sections, so acknowledged, of all North America, the most reasonable hypothesis would point to the hamidless atmosphere as the prime factor in the case. Texas has an atmosphere exactly similar, and hence there would seem to be nothing against the establishment of a bel ef that Texas, if fairly put to the test, would prove as great a bar-

lev country as the greatest.

There is much more profit in barley than there is in wheat, hence it behooves our farmers to hustle themselves in the direction of finding out what they can make the crop do for them. As estimated in the letter, Boston would probably take a large share of our projuct, but really there would not often come up a necessity for going so far in search of a market. All the non-barley producing tates are full of breweries, more or less, and all are forced to send away for their raw material. The day would not come, even though we should make barley our leading staple, when we would be unable to find ready sale for every bushel of our product. The United States is rapidly becoming a nation of beer drinkers, and it takes barley to make beer, and barley, as al endy intimated, is not a crop of general range-it is confined to regions with certain peculiarities.

In the state of Texas there will soon be many breweries, all of which will be depending upon some distant region for their raw materials, unless we get to producing them at home. If we can produce those materials at home (or even one of them), how much better it would be for our breweries as well as for our-The indicat ons are that we can do it if we will. Let us at once proceed to try the thing on all over Northern

Hop Cutture for Texas.

While talking on the subject of beer materials, we may as well go the whole hog by inflicting upon our readers a short article on hops, another product that enters into the manufacture of beer, and without which beer cannot be made. It appears that the same natural conditions necessary to the successful growth of barley are also necessary to the successful growth of hops, hence we usually flud the two crops growing in the same regions of country. California, Canada and some of the older but extreme northwestern states produce all the hops grown in this country for commercial purposes. If Texas can grow barley, a thing that ean scarcely admit of a doubt, then it is not unreasonable to surpose that Texas can also produce the hops required to go with the barley in the manufacture of beer.

So far as we know, there has as yet been no test made of Texas-grown hops, but this fact is nothing against the strong probability of our being able to make of the crop a grand success. The hop grows with us almost like a will weed. We have traveled no little in the hop countries, and have seen the crop there in all its stages of growth; we have also seen a hop vine growing here and there about peoples's houses in Texas, uncared for, of course. After summing together the results of all our observations in the premises, we must testify that the most luxuriant and thrifty hop vines yet seen

by us we saw in the state of Texas. The hop for best success wants a limey soll—this we have in full. It also wants more or less rain early in the season to push up the vines and set the fruit— Texas is entirely all right in this particular. After the pushing season, is needed a season comparatively dry, to check the growth of vine, mature fruit and make up a favorable time for harvesting-Texas fills this bill to the

We are entirely satisfied that the hop could be made as good a success in the upper portions of Texas as characterizes it in any other section of the world. The only thing that might be urged against going into hop culture for profit here, at present, is lack of cheap labor. A great deal of labor is required at harvest time, and in order to build up a successful competition with some of the cheap labor hop regions, labor would have to be comparatively cheap. Hop gathering is mainly performed by women and children-in our present thinly settled condition we might not just now be able to employ enough of these to harvest large crops. But this kind of thing will not long last-Texas is rapidly settling up; when she gets a reasonably heavy population the localities so populated will doubtless make lots of money cultivating hops.

#### Glucose Production in Texas.

Texas is a most loyal member of the American union, and doubless membership in that confederation gives her entire satisfaction in every particular; yet, after taking a calmn view of her as she is one can scarcely dispel the conviction that nature originally intended Texas for some other position. She has within her borders everything that a distinct nation could need. No other state in our association is as favored in this particular; indeed it may be rather safely maintained that no other area of the same size on the whole face of the globe is so favored. If a wall so high that man could not scale it was thrown around Texus the Texus people would live and prosper inside without finding themselves put to any inconvenience whatever, once they fairly understood the situation and got themselves squarely down to business.

But we started out to carry the subject of beer materials one step further. In the two preceding articles we have shown, we think; that Texas can produce the two leading I gredients of beer. Supposing that Texas was put to the necessity of manufacturing her beer from the stump, as we say, there is still another product that she would needsugar. The sugar now most generally used by the brewers of this country is glucose, a substance which, when evapprated to dryness, is known as grape sugar. It is a much obeaper material than cane or beet sugar, but brewers tell us that were this otherwise they would still use glucose, as it works better and gives better results than does the cans engar Glucose is usually manufactured from

corn, and entirely, we think, in the Northern states. Irish potatoes are sometimes worked into the finer grades of gincose, they making a better article than eorn, but the corn article is less expensive, and hence the one most common on the market Now, should Texas be forced to make

her own beer from her own materials, phere at certain seasons of the year has a she would be placed under the necessity great deal to do with it A compara- of producing glucose. This she could do tively humidless atmosphere is one of from corn, of course, yet she would not be driven to the use of corn; she could beat corn by long odds. Careful test has fully established the fact that sweet potatoes yield equally as fine a grade of glucose as Irish potatoes, and that the yield is much larger. Test has further shown that two bushels of sweet potatoes will make fully as much glucose as one bushel of corn. It does not call for the finest and sweetest potato to make the greatest yield, glucose being purely a transformation of starch. Our commonest and most productive sweet potatoes are richest in starch. Of these varieties a very large per cent, of the lands of Texas will yield 400 bushels to the acre, with less labor and outlay than would be required to cultivate an acre to corn. For the manufacture of glucose, then, we have in our acre of sweet potatoes as much material as we would have in 200 bushels of corp-more than four times as much corn as we could reasonably expect to get from one acre, on an average. So, you see, we are solid enough on the glu cose question. We hope that it will be understood

that we are not advocating the production of beer at all, but merely attempting to to show something of what Texas is able to do People will drink beer, and some regions of country must produce the raw materials out of which to make it. Should Texas produce these materials on a large scale they would, of course, bring big money to Texans, while, at the same time, it is not at all probable that they would lead to manufacture of one gallon more of beer than would be manufactured did Texas have nothing whatever to do with beeryielding products. Why not, therefore take in our share of the money while it is going, and will be sure to go anyway, provided we are able to do so.

This sweet potato glucose question is certainly one of great importance to The glucose used in the manufacture of beer is proportionately less than a single drop in a barrel of water. Glucose is being used everywhere. Ninetenths of all the syrups and molasses nov on the market are either pure glucose. or they carry a larger or smaller per cent. of glucose as an adulterant. General taste has become educated to a demand for it. A strictly pure cane molasses would strike the taste of a large majority among the masses as having something wrong in it. There would b what they would call "an unnatural flavor'' about it, they being accustomed to the glucose flavor, so they would take the mixed article in preference.

There is doubtless millions for Texas in the production of sweet potatoes and th manufacture of glucose syrups from them. Once into it sright we could (if we desired to do so at the expense of large profits to ourselves) completely run the corn glucose out of every American market. Our advantages over the corn glucose makers would stand as two hundred bushels of corn to the acre against their thirty or forty.

Professor Hill on Irrigation. Professor Robert T. Hill, the well known Texas geologist, writing to the Austin Statesman with reference to irrigating the Colorado valley below that city, says: "With irrigation there is no

such thing as failure; without it drouth and want are common. With irrigation of the Colorado Austin could have abundant, varied and constant supply of vegetables and fruits and be relieved of the enormous tax we now pay for irrigated Western fruits. With irrigation every five acres of the Colorado valley would support in luxury a family, whereas without it it is now difficult for a farmer to earn a living upon twenty acres. Irrigation would enable farmers to relieve themselves of the cotton growing slavery to follow a higher agriculture. Irrigation would enable Austin to possess canning factories and thereby increase our manufactory resources. An acre of irrigated land of t s proper kind produces \$100 to \$300 worth a year. An acre of cotton seldom produces more than \$20 net a year, and requires the maximum of labor. It is a great mistake to suppose that irrigation should be produced only in arid regions, and to think that Central Texas does net need it. The wealth of Texas is pre-emi-

nently in her soils, which exceed in value all possible mineral possibilities, and this soil is too rich to be forever devoted to poorly paying plantation crops, unworthy of the highest skill of the Anglo-Saxon laborer. Even where the rainfall is treble ours, irrigation is practiced most successfully. Not only does it give water, but also fertility to the soil, and by its aid the rich red raises of the Colorado and the Brazos valleys, laden with gypsum, lime and other ingredients, would restore and maintain the sandy loams in the Colorado valley below Austin in a high degree of fertility.

"The subject of irrigation is assuming such proportions in the United States at present that it is merely a question of years when we will see the rivers and artesian wells of Texas quadrupling our agricultural productions. ''

So say we. We must arrive at a means of making our lands produce more than they are now producing ere we can ever reasonably expect to become a highly prosperous people. We have had people tell us that the country is already producing more than it can sell. Why? Because there are not more consumers, of course. Heavy production invariably brings heavy local consumption, but light production cannot do otherwise than hold a country down to a thin population. If every cultivated acre in Texas could be made to produce four times as much as it now produces. Texas would draw so strongly upon all parts of the civilized world that but five decades would go by ere people would be living everywhere within calling distance of each other. And they would not all be soil workers, either-a very large proportion of them would be consumers and not producers of soil products. An extremely pros-perous agriculture brings in thousands of other industries. The products of the soil must be worked up in some way, and where they exist in attractive abundance those workers invariably come to take charge.

The over-production plea is simply nonsense, and to hold back on account of any such notion is exactly on a par with having a rich gold mine and running it on half time through the fear that more gold would be taken out than would be in demand. The products of the soil are more than gold. People of all the world live off them directly or indirectly. Gold is all well enough for ornamental purposes, or as a medium in commerce, but life left to gold alone would soon become extinct.

A Three-Horse Evener. It sometimes becomes necessary to

work three horses abreast, especially in breaking sodded prairie. This cannot be done to advantage without arranging what is quite generally called an "evener." The old Tennessee plan of working three horses is to hitch two m the rear on a doubletree, in the usual way, and then singletree one in front, but this is rather a troublesome plan, and Texas is seeking to dodge all troubleme plans as far as possible. It is much the most convenient to work the three horses abreast on an "evener," and a late issue of the Germantown Telegraph undertakes to tell us how the "evener should be made:

"If the three horses to be worked together are each of about the same strength the thing is simple enough. Shape out a piece of hard wood about as you would shape a doubletree for a wagon. Bore the end holes as for singletree clevises, then measure the space between them into three parts, and at one mark bore a hole for the main clevis. Now doubletree is just twice as long at one end as the other. Next, book on a singletree to the long end, and a doubletree with its two singletrees to the short end. Hook your team up, go to work. Now for the reason The horse at the long end has twice the length of lever from the kingbolt that the two horses on the short end have, and thus each horse has his equal one-third of the draft to himself. If one of the horses is lighter than the others, shift the kingbolt hole further toward the short end. If this is put in its right place each horse will still have one-third of the work to do, and no more. To arrange for this contingency a hole may be bored on each side of the one-third measure iole, and the kingbolt shifted as test shows the case to require."

This hint may prove of value to the person working a span of horses on the ordinary double tree. Bore several holes and shift the kingbolt in favor of the weaker horse, where there is a difference in the strength of the horses. The weaker horse should always have the longest end of the lever, just the same as the weakest man at a lift is given the longest end of the bandspike. It is science and common sense. Stay chains are simply an abomination in such cases

Pasture for Hogs.

Mr. H. E. Singleton, says through Farm and Ranch, that he regards pasture for hogs as something specially important. He does not consider vegetation absolutely necessary to the existence of the animal, but it is needed to keep the system in a condition to ward off disease and enable the digestive organs to utilize and assimilate the greatest amount of grain. Not only from the green food esten is the benefit derived, but the exercise required in gleaning this food is of great benefit, to say the least. But green food should not be depended upon exclusely. He never had a pasture even where he had red clover in its perfection, so good for bogs but what a little grain in connection could be fed with the greatest profit, especially to young and growing animals

And instead of feeding all corn for six months of the year, and allowing the hogs all the grass they can find for the other six months without grain, he advocates feeding some grain all the time, and furnishing geen food at all seasons

Mr. Singleton next discusses the grasses best suited for hog pasturage in Texas. some, he says, and Johnson grass by others. He don't doubt their being fine bog grasses, but since both are grasses

that want the whole earth, he hopes neither may ever get near enough to him for his hogs to acquire a taste for them. But he fears hope is delusive, for in his rounds he sees them coming nearer each year and holding every foot of land they once occupy.

Mr. Singleton favors sowing oats for a hog pasture—a spring crop and a fall crop. Rye also comes in well, say oats in April and on the same land rye the last of July, then fall oats, and so on.

Rye, one of our most neglected cereals, he considers one of the most profitable for many portions of Texas. It has proved so in his section-he writes from Lebanon. It can be sown early or late, on rich or poor soil, pastured all winter until late in the spring, and then make as good a vield of grain as wheat and command as good a price in the markets. So that the pasturage from the land is clear profit.

Not Really a Boll Worm.

In an article of some weeks ago we stated that the boll worm did not work in cotton bolls from choice, but merely because they happened to offer it a source of food. We took the position that it was not really a "boll worm" at all, but a worm that fed upon cotton bolls perhaps from sheer necessity, and that, in all probability, there would be just as many boll worms in Texas as have an existence at present was there not one stalk of co ton growing in the state. It is an insect of wide range in its food, and seems to get along about as well as one species of succulent plan as upon another. Mr. Jeff Welborn of New Boston, Tex., writing for Farm and Ranch, backs up our position by saying: "I have been out all day in the pea field where we had some hands picking; the pea field lay broad beside the cotton patch-just a turning row between them. The pea field seems alive with the boll worm-millers-but not one did I see in the cotton, although the cotton was large and very green, (planted first of June). Nor did I find a bell or square pierced, while in the peas full 5 per cent. of pods had worms or the holes This proves that "boil worm'' is really a misnomer, for here it was made plain that the worms entirely preferred other food to cotton bolls.

### ANSWERS TO CORRESPONDENTS.

This department is devoted to answering such questions as may be asked by our subscribers, which may be of general information. Inquiries of personal character that require answer by mail should always have stamps inclosed. Please give full name and postoffice address, in addition to any such signature as "Subscriber," or "A. G. D.," not for publication, but to enable us to communicate promptly with the inquirer, Parties desiring answers by mail must inclose tamp for return postage. tamp for return postage.

The Northern Catalpa.

In your reply to Emma George about catalpa rees you say you do not know whether or not the Northern catalpa (Catalpa speciosa), grows South. I wish to state that in 1882, I procured from a nurseryman in Missouri, 100 trees of this species, and got near all of them to grow. I have just been out and measured an average tree standing in my yard—it m asures at the ground thirty-two inches in cir um erence, and seven feet up it measures twenty-one inches. This is what I would call a pretty good post for eight years of growth. I only wish I had ten acres of such trees.

riave never seen any healthier or more thrifty riave never seen any healthier or more thrifty trees than these catalpas. I gave four of the young trees to one of my neighbors and he planted them on the ends of some peach tree rows in his orchard about the first of May, and in October two of them had grown from six inches in height to seven feet, and were at least two inches in diameter at the ground.

If I wanted Northern catalpatrees in thousand iots, I would send for them to any reliable nurseryman in either Missouri or Illinois, who keeps them in stock. They can be had in aimost any handleable size desired.

Ennis, Tex.

Since writing the article referred to by Mr. Hogan we have seen some fine young northern catalpa trees in the stock of s Fort Worth nursery man. It is highly probable that most of our Texas nurseries keep them.

Another Fibre Turns Up.

I send you herewith a sample of fibre taken from a weed which is plentiful hereaboutsgrows in the roads and about old lots. It looks like a cotton piant, only i, is of a lighter green as to foliage, and the stems, etc., are lighter in color than the stems of cotton. I think it has a small yellow bloom. Will you tell us through your agricultural department what it is?

F. B. Ballulo.

F. B. BAILLIO, Editor Bulletin, Alvarado, Texas The sample of fibre, which is wholly from the bark of the plant, is very pretty indeed, much resembling jute fibre, though not near so strong. deficiency in strength may be due to the process of preparation employed in this particular case. Rut even supposing the fibre to be no stronger under a different mode of preparation than it appears in the specimen sent, it would still, if abundant, be likely to prove of value as a material for filling mattresses, cushious and the like.

Our correspondent puts up rather a hard job for us when he suggests our identification of a plant from a mere specimen of dry fiber. We have been guessing through several days and some in the night in an effort to settle upon what manner of large plant they have growing in their roads about Alvarado. Acting upon the hope of striking a clew. we have explored all the roads about Fort Worth, but they are as bare of vegetation as a billiard table that uses genuine ivory balls. In the early stages of our agony we settled down upon the cocklebur as the plant our friend was waggishly giving us a chance to guess at, but a small section of cuter-bark left in the fibre completely knocked that thing out when we placed it under the microscope. The structure of this outer-bark appears to point to some member of the mallow family, though, on account of similarity in bark structure peculiar to the mallow family of plants, we are, of course, unprepared for bazarding any opinion as to which species it is.

On Keeping a Cheap Restaurant.

In past numbers of The Gazerre, as I have oticed, you have told inquiring readers where hey might obtain certain books that they were desirous of buying. This thing, being a regular eader of your paper, has emboldened me to ask you where I can get a book giving full particulars with reference to the restaurant business. I am a good cook and my wife is another, and we are thinking of starting a cheap restaurant in this place (regular meals twenty-five cents), but there are some things about the business that I do not clearly understand, so I have thought it would be best to get a book to set me all right in the matter. For instance, there appears to be a great waste of victuals, which, it seems to dee a cheap establishment could not all right in the matter. For instance, there appears to be a great waste of victuals, which, it seems to me, a cheap establishment could not well stand without some way of utilizing it. Half the persons ordering a dinner do not use one-third of the victuals placed before them, fet they almost invariably muss over everything so that it would not do to place before the next customer. They don't want all that is offered them, but they spoil it just the same, and they'd grumble world's without end if it wasn't there. Is there a market in any way for this bemeased stuff? One of my neighbors says it is sold to negro families at a low price, but after careful inquiry on the part of bo h myself and wife we cannot find a negro or negroess who ever buys anything of the kind from a restaurant. They all simply get mad when we mention it to them I saked a cheap restau ant man about it and he said the refuse had to be thrown away, but a street scavenger has assured me that he never sees anything of the kind in the trash barrel. One gentleman suggested that I try the temale manufactureers for a market, which I did, but the temale man was a Mexicau, and when I had got squarely down to business he wouldn't any longer understand a single word of English. There are, no doubt, many things tast I might learn from a book, with reference to the cheap rectaurant business, and that's why I'd like to get one. My wife thinks we might get along by permanently hiring an experienced headwaiter and depending upon him for information, but I'd rather have the information all my cwn if I can get it from a book. Please don't print my name.

Dallas, Texas.

There is no such book as you ask about. Like some of our secret societies the great "traternity" of chear restaurant keepers has no written ritual. Such a work might be all well enough if the restaurant men had a language of their own that no outsider could understand, and the book was written in that language. but since this is not thus, and since almost everybody can, nowadays, read plain English in plain print, and since that book might meet with patronage outside the "fraternity," the possibility exists that it would do more harm than good-that is, it might-well, it might make the business too common. Good cooking, such as yourself and

your wife can do, is a good thing, even for a cheap restaurant. It will draw every time; but, as you suggest, there are many other things that you ought to learn before risking an embarkation into the business. The absence of a book need not set you back, however. There is another avenue open to you: become one of the "initiated;" in other words hire yourself out to a cheap restaurant as a waiter or in some other position that will take you all through the machine. Don't be particular about the wages offered you. Keep your eyes and ears open, but never intimate that you have a notion of picking up the trade for yourself. It is not likely that any restaurant will keep you long, for good reasons well understood by the craft, but that doesn't make much differenceon receiving your walking papers you can hustle around and soon hitch onto some other house for a little season. Don't be in a hurry. Keep up the servitude until you are a master workman When you are finished you can impart your information to your wife and get

ready for the new restaurant. Your wife will be surprised at the unlooked-for fund of information you have picked up. She will find that, though both good cooks, as you claim, you were both hopelessly ignorant so far as relates to cooking for a cheap restaurant. Many of your best old-fashioned plans will have to be entir ly discarded, even hash, which you may have so fondly discussed in connection with ba k-number meats, will be forced to slide out of the programme, you having learned that hash is only a concomitant of the boardinghouse breakfast, and hence would not go down with the patrons of a restaurant. But you will more than make up for this important loss by giving her the latest method of getting up "stewed meats," and of making soups, rice custards, mince ples in winter, and various other things that the craft knows more about than it is necessary the customer should Your hands will be so full of know. other business that you will devote no time to any more worrying over the waste of victuals mentioned in your let-

When you are an adept you will promptly explode your wife's notion of hiring a head waiter and depending upon him as your source of information. You'll tell her that the first thing you'd know (a thing you wauld be very apt to never know) some independent American citizen who had learned something of despotic country ways, would tip that head waiter, and that, after this little personal performance, your profits on the patronage of said independent American citizen would be comparatively small. Upon this you will strongly urge the bu liness necessity of associating with the cheap restaurant routine a rapid change of waiters. But, should you take our advice, you'll soon know all about how it is yourself.

On Street Trees for Northern Texas. I have read with much interest your recent ar. ticles on street and shade trees for North Texas towns. The subject is one over which the people of Ennis are now much concerning themselves-Some of us strongly favor one kind or class of trees, while others favor something else, hence I thank you for your wiltings in The Gazerre on shade trees, as I consider it ahead of any-

thing we have had up.

As to the laurel oak (a tree known pin oak in some localities) I state that there is no more beautiful tree in all the South, becoming almost a perfect sugar-loaf in shape when it has attained to the height of from fitteen to twenty-five feet. Another great beauty attaching to it lies in the fact that it is an evergreen, and hence continues to look its best when all deciduous trees are bare. It is furthermore one of the most rapidly growing oaks known, as you state, and I can growing oaks known, as you state, and I can bear witness.

The laurel oak already grows in various sec-

tions of Texas, where the young trees may be had on made or alluvial lands along river and creek bottoms.

You also struck it right on the mock orange, a

You also struck it right on the mock orange, a tree sometimes called wild peach. It is a most beautiful evergreen, hardy and thrifty along the rivers of Southwestern Texas, where it makes good sized trees. Can be trapsp anted to any of our uplands, either black waxy or sandy loam, and does well every time.

Our wild cherry, though not an evergreen, is another beautiful shade tree too much neglected in Texas. It is easily grown and though considerably used by our people as a shade tree, it ought to be more witely adopted. Then, the live oak with us is a perfect success and a permanent evergreen, making a grand shade tree. It ought to be extensively planted in every North Texas city. As you stated, slow growth seems to be the leading objection to it, but if thrifty young trees are carefully selected only a few years would elapse ere they would be giving our towns quite a tropical appearance to visitors from the North down to spend Christmas with us.

Ennis, Tex.

The live oak (Quercus virens) is, sure enough, one of our grandest trees, and its name is as closely associated with the sub-tropical South as is that of the magnolia. It ought to be largely planted,

for it is entirely at home in every part of Texas, and even though the planter should not live to see it a large tree (which he would not be apt to do) it is entirely beautiful as a small tree. In Mobile, Ala., there are many live oaks measuring more than three feet in diameter, and extending their branches over near 100 feet, but they are very old, having been planted in the early days of the town, say 150 years ago. We'd always plant live oaks, but for quick development either the laurel or the water oak is to be preferred, of course. The laurel oak would be larger at thirty years of age than the live oak would be at the age of 100 years, and the former is certainly the most beautiful tree in every respect. Strangers from the North never think of the laurel oak as being other than the live oak. There is plenty of room for both species, however.

We would have expected to find both the laurel and the water oak growing in the pine regions of Eastern Texas, but we have never yet seen either along streams in other portions of the state. Of course this is not to question the correctness of our correspondent when he savs the laurel oak grows along streams in various sections of Texas, for he is a well informed gentleman, and doubtless knows exactly what he is talking about. We gave the botanical name of the tree (Quercus laurifolia), in the article referred to by him else from what he says of its sometimes being called pin oak we'd think he might have mistook us as to species, though his description of the tree tallies well with the appearance of our "swamp" laurel oak. The true pin oak (Querous palustris) grows abu slong many of our rivers-the finest growing on the Brazos not far from Cal-

vert. It is not strictly an evergreen, though its leaves are fairly hardy, usually hanging on for a considerable time after most other deciduous trees have dropped their foliage. The leaves of the two species look a good deal alike.

### POPULAR SCIENCE.

Astronomical Phenomena-Chalk Fermation in Texas-Electric Lights and Vegetation-Electricity in the Dairy, Etc.

The astronomical phenomena of this week may be put down as specially interesting, yet no extended mention of any of them is called for at our hands, owing to the fact that in these notes we have already pointed out similar phenomena with a view to locating the planets. On this, Sunday night, (12th), the moon will be in conjunction with the planet Mercury, but the moon being very near its charge, which takes place on the 13th, the conjunction will be invisible.

Mercury is the nearest positively known planet to the own, and the smallest in our regular planetary system. His diameter is 3000 miles, and his distance from the sun 35,000,000 miles. There is supposed to be planet inside the orbit of Mercury, which astronomers have named Vulcan, yet nothing is yet fully known with reference to the matter.

On Tuesday night (14th), the moon will be in conjunction with Uranus, but this conjunction will also be invisible. Uranus is the seventh planet in our system, reckoning from the sun. Size of planet 33,000 miles in diameter, and distance from the sun 1,753,000,000 miles. On Friday evening (17th) the moon will be in conjunction with Venus, our beautiful evening star. The conspicuous star seen only about one degree from Venus on this same night is the fixed star Antares.

The calculations upon which we draw for this information were made for the longitude of Washington City, consequently we don't find the conjunctions appearing so close at Fort Worth as they would appear thers. In most cases the moon and the planet are about as near each other the night before as they are on the night named.

As was stated in a former note of this column. Fort Worth sits upon what is known to geologists as the cretaceous or chaik system. Some of our people have expressed surprise at this, giving as a reason that they can see no chalk. They do see chalk every day of their lives when they are out on our streets. Professor Dumble, state geologist, says in his first annual report, page xlv.: 'Chalk is essentially a deposit formed in deep seas, and usually contains remains of minute forms of life, which existed in the water. These (chalk) deposits may retain their original character or be hardened by various agencies into limestones." It will thus be seen that all the limestone underlying Fort Worth is simply hardened chalk. Time was when it was soft like the ordinary chalks, but some agency has bardened it into limestone. If you examine a specimen closely you will discover that it presents much the appearance of ordinary chalk, about all the difference to be noted lies in the fact that it is too hard to mark with.

Professor R. T. Hill in first annual reort geological survey of Texas, page 105, says of this chalk formation, that it occupies the area of the state known as the black prairie, the grand prairie and the two cross-timbers, and unstuded areas in the eastern and trans-Pecos ment. Liberal commissions. Recomareas in the eastern and traus-Pecos regions. • • To these [chalk] strata the state owes a large part of her black waxy and other calcareous soils of those regions. In addition to their agricuttural features they are the most productive source of building. agricultural and general prosperity, for while adjacent to the parting between them, extending the entire length of the state and depending upon their straties graphy, is a remarkable area for artesian wells, as seen at Fort Worth, Waco. Austin, Taylor, San Marcos and elsewhere.'

With reference to the chalk region Professor Hill further says in the same report, page 106: "The rocks originated as sediments of the Atlantic ocean, laid down with great uniformity during two of the long epochs of subsidence and emergence when the waters covered this region many hundred fathoms deep. These ancient sediments are now more or less consolidated, and are elevated into a fertile land which is decomposing under atmospheric conditions into soils and debris, and in its turn being slowly transported to the ocean, where it will make other rocks. They now occur in regular sheets or strata, dipping beneath each other toward the sea, while the projecting western edges, each of which weathers into and imparts its individuality to its own peculiar belt of country, outerop in long, narrow belts, sub-parallel to the present scean out line. Thus it is that as one proceeds inland from the coast, he constantly crosses successively lower and lower sheets of these formations. The oldest, or lowest, in a geological sense of these outcrops, forms the upper cross timbers, those above these make the grand prairie, the next sheet forms the lower cross timbers, the next the black prairie, etc. Each of these weathers into a characteristic soil, which, in its turn is adapted to a peculiar agriculture. Each has its own water conditions and other features of economic value.'

The influence of the electric are light. such as is soon to illuminate all Fort Worth, is said to have been strikingly shown in Berlin in the spring of this year. On some large lime trees, the branches under the electric light displayed new leaves of considerable size while the buds on the opposite branches where the light does not strike were only just beginning to develop. The effect on vegetation to result from the genera lighting of a city may not be great enough for one to note it, yet, if this Berlin report be correct, and the Berlin scientists are seldom much off, our electric lights will really give us an earlier spring (little earlier though it may be) than has characterized our locality in the past.

The use of emery for grinding and polishing purposes will soon be a thing of the past, it is supposed fine, high-earbon steel tempered to greatest possible hardness, and then crushed in a powerful stamp mill, is rapidly taking its place. It cuts stone and other substances more rapidiv than emery, and is said to be far cheaper.

There is now a reasonable promise that electricity will soon be filling an important office in the dairy. Professor G. lomel, a noted Italian scientist, has lately made some important tests. He reports that when electricity was applied directly to fresh milk the souring

was delayed, sweetness being retained from six to nine days, whereas a portion of the same milking not treated with electricity was distinctly acid on the third day. The electrified milk congulated exactly like ordinary milk, and not like milk that has been boiled, but the congulated milk had no noid qualities about it. He thinks milk might be kept sweet a year by repeating the electrical application once in every three or four days. The theory is that electricity destroys the germs that bring on the seid condition.

Should this prove correct there exists a strong probability that meats and other substances liable to "spoil" might be preserved in the same way. Possibly the body of a deceased person might be kept perfect for any time desired by a repeated application of electricity.

Of the time when astronomers shall have a telescope of sixty inches diameter and eighty feet in length, M. Camille Flammarion savs: "To what unexpected discoveries would this supreme effort of your great ninetsenth century lead? This is a question which it is impossible answer, but we have the right to awell on the word 'unexpected.' It must not be forgotten that it was when searching for the limits of the colors in the solar spectrum that Fraunhofer discovered spectral analysis, and that it was while seeking the parallax of the sturs that Sir William Herschell discovered the orbits of double stars, and it was when seeking for Asia that Christopher Columbus discovered America. In any event, such a telescope will enable us to see for the first time the seventeenth magnitude stars, which must be scattered over the depth of heaven in a carpet of \$18,000,000 stars, while the meon will be brought, so to speak, within touching distance.

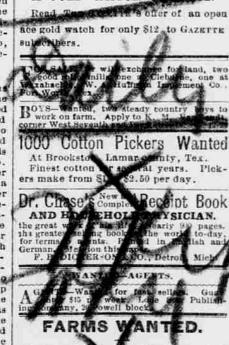
In these notes we, hoping to interest the young people, have had a good deal to say about planets. The asteroids are another grade of very small planets that we have not heretofore found an occasion for mentioning. There are said to be 290 of them, all running on regular orbits around the sun, but all too small to be seen with the naked eye. In recent years there has been quite a craze among astronomers for bunting them, but now the hunt seems to have been relinquished to a small group of specialists, one of whom, M. Palissa, has detected no less than seventy of these tiny worlds in his sixteen years of work. Mr. Peters of Slinton, N. Y., has discovered fortyeight; Mr. Luther, twenty-live, in about forty years, the brothers Henri-whose attention is now absorbed in astronomical photography-seven each, and M.

The known matter of the earth, including water and air, and assuming the known crust to have a thickness of ten miles below sea level-is calculated by Professor F. W. Clark to have the following percentage composition: Oxygen, 49.98; silicon, 25.30; aluminium, 7.26; iron, 5.08; calcium, 3.51; magnesium, 2.50; sodium, 2.28; potassium, 2.23; hydrogen, 0.94; titaium, 0.30; carbon, 0.21; chlorine and bromine, 0.15; phosphorus, 0.00; maganese, 0.07; sulphur, 0.04; barium, 0.30; nitrogen, 0.02; chromium, 0.01. At the lowest estimate, nine elements constitute 98 per cent of all terrestrial substance. Towing the density of the earth's crust as 2.5, it is found that the percentage of atmosphere is 0.03; of ocean, 7.08; and of solid crust, 92.89.

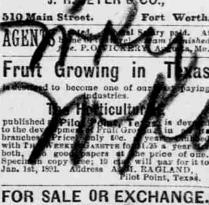
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